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# Southern Provincial Department of Education

## Year End Test - 2017

Science - I

Grade 10

Name / Index No. ....

Time - 1 hour

Important:

(i) Answer all the questions

(ii) In each of the questions 01 to 40, pick one of the alternatives (1), (2), (3), (4) which you consider correct, or most appropriate.

(iii) Mark a cross (x) on the number corresponding to your choice in the answer sheet provided.

- (01) Select the answer which contains seeds adapted to disperse only by wind.  
(1) Love grass, Wara      (2) Orchid, Olu      (3) Olu, Hora      (4) Wara, Hora
- (02) Out of the changes taken place in the human ovary and the uterus, a main phase taken place in the ovary is,  
(1) menstrual phase      (2) Luteal phase  
(3) Secretory phase      (4) Proliferation phase
- (03) An electron is a,  
(1) negatively charged particle      (2) positively charged particle  
(3) neutral particle      (4) particle present in the nucleus
- (04) What is the unit of the moment of force?  
(1) J      (2) Nm      (3) Nm<sup>2</sup>      (4) Js<sup>-1</sup>
- (05) Which of the following moves according to the pair of action and reaction?  
(1) toy car      (2) rocket      (3) Sailing ship      (4) kite
- Eight consecutive elements in the third period are given below. Answer question No. 6 and 7 using them.
- Na , Mg , Al , Si , P , S , Cl , Ar
- (06) Element which has completed all appropriate number of electrons in the energy levels is,  
(1) Na      (2) Si      (3) Cl      (4) Ar
- (07) What is the element that makes a stable ion with a charge of 2<sup>-</sup>?  
(1) Mg      (2) P      (3) S      (4) Cl
- (08) Which of the following is a usage of equilibrium of forces?  
(1) Rotating raban on a pole.      (2) Sucking drinks from a straw.  
(3) Cutting clothes using a scissor.      (4) Pushing a weight.
- (09) The town P is located higher than the town Q when height from the sea level is considered. The minimum height of the mercury column of a correct mercury barometer placed in town Q can be,  
(1) 65 cm      (2) 69 cm      (3) 76 cm      (4) 78 cm
- (10) Water soluble vitamins are,  
(1) Vitamin A and Vitamin B      (2) Vitamin B and Vitamin C  
(2) Vitamin C and Vitamin D      (4) Vitamin D and Vitamin E

(11) An object with the mass of 20 kg, moves with an acceleration 'a' when an unbalanced force F acts on it. What will be the acceleration of the object with the mass 40 kg when the same unbalanced force acts on it? (In both instances, objects move on a smooth horizontal plane)

- (1)  $\frac{a}{2}$                       (2) a                      (3) 2a                      (4) 4a

(12) An electron microscopic, diagram of an organelle of a cell is shown below. Select the answer which shows the organelle and its function correctly.

- (1) Endoplasmic reticulum - Supplying places for synthesizing proteins.  
 (2) Golgi bodies - Cellular respiration  
 (3) Golgi bodies - Producing secretory products and storing  
 (4) Endoplasmic reticulum - Transporting function



(13) Which of the following is a usage of genetic engineering?

- (1) using bio pesticides.  
 (2) producing improved seedless oranges.  
 (3) using E-coli bacteria for the production of Insulin.  
 (4) breeding hens that produce large number of eggs.

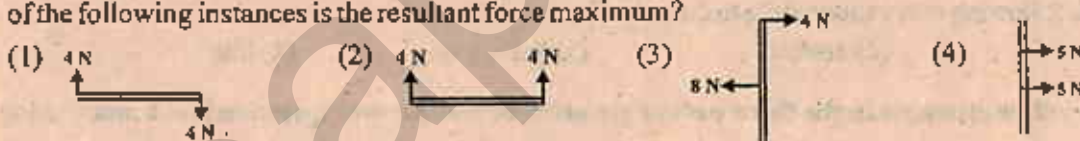
(14) The amount of substance that contains as many basic building units as there are atoms in exactly 12 g of  $^{12}\text{C}$  isotope is known as,

- (1) Avagadro constant                      (2) mole                      (3) molar mass                      (4) formula mass

(15) A file clip is attracted by the poles of a strong bar magnet. The file clip is at rest initially. Which of the following is its velocity time graph when being attracted by the magnet?



(16) The diagrams below show four instances that two coplanar parallel forces act on the same object. Which of the following instances is the resultant force maximum?



(17) Which of the following molecules contains triple bonds?

- (1) Hydrogen molecule                      (2) Oxygen molecule                      (3) Nitrogen molecule                      (4) Chlorine molecule

• Question No. 18 and 19 are based on the informations given below.

Relative atomic masses of H, C, N, O and S respectively are 1, 12, 14, 16 and 32

(18) Which answer shows the pair of compounds with similar relative molecular masses.

- (1)  $\text{CO}_2$  and  $\text{NH}_2$                       (2)  $\text{NO}_2$  and  $\text{CO}_2$                       (3)  $\text{H}_2\text{O}_2$  and  $\text{NO}_2$                       (4)  $\text{H}_2\text{O}_2$  and  $\text{H}_2\text{S}$

(19) Select the answer which shows the number of atoms similar to the number of atoms in 7g of Nitrogen.

- (1) 6g of oxygen                      (2) 6g of carbon                      (3) 7g of oxygen                      (4) 7g of carbon

(20) Four statements regarding classification of organisms are given below.

- A - Pinus is a flowering plant with seeds.  
 B - Green algae belongs to the kingdom protista.  
 C - Organisms belong to Domain Archaea live in extreme environments.  
 D - Leaves of Monocotyledonae plants possess a parallel venation.

True statements out of them are,

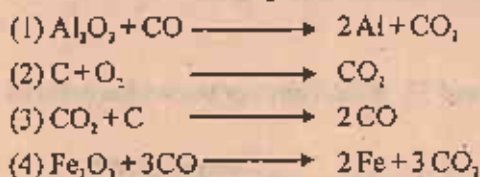
- (1) A, B and C                      (2) A, C and D                      (3) B, C and D                      (4) A, B and D



- (21) Select the correct statement
- (1) Albinism is a disease inherited from a sex linked recessive gene.
  - (2) Thalassaemia occurs due to linked recessive gene.
  - (3) Haemophilia is inherited from an autosomal chromosome and a linked recessive gene.
  - (4) Haemophilia is inherited from a X linked recessive gene.
- (22) Relative atomic masses of elements H and S respectively are 1 and 32. Which answer shows the mass of  $H_2S$  molecule?
- (1)  $6.022 \times 10^{23}$  g
  - (2)  $6.022 \times 10^{23} \times 34$  g
  - (3)  $\frac{34}{6.022 \times 10^{23}}$  g
  - (4)  $\frac{6.022 \times 10^{23}}{34}$  g
- (23) An iron sphere falls freely vertically down from a height 'h'. At which height is the potential energy of the iron sphere equal to the kinetic energy?
- (1)  $\frac{3h}{4}$
  - (2)  $\frac{h}{2}$
  - (3)  $\frac{h}{4}$
  - (4)  $h=0$
- (24) What is the answer that shows the groups of animals respectively that bee, snail and earthworm belong to?
- (1) Molluska, Arthropoda, Annelida
  - (2) Annelida, Molluska, Arthropoda
  - (3) Arthropoda, Molluska, Annelida
  - (4) Molluska, Annelida, Arthropoda
- (25) Which of the following metal reacts with diluted HCl?
- (1) Ag
  - (2) Pb
  - (3) Pt
  - (4) Au
- (26) Which of the following is not a significance of carbohydrates?
- (1) Using as a source of energy in cellular respiration of organisms.
  - (2) acting as a storage compound.
  - (3) acting as a structural component in organisms.
  - (4) acting as molecules storing genetic information.
- (27) Corresponding values for x, y and z respectively in the equation,  $x Al + y O_2 \longrightarrow z Al_2O_3$ , are,
- (1) 4, 2, 2
  - (2) 4, 2, 3
  - (3) 2, 3, 4
  - (4) 4, 3, 2
- (28) Several properties of compounds are shown below.
- A - fused compounds conduct electricity
  - B - exists as ionic lattice
  - C - consists of molecules made out of several atoms.
  - D - has relatively low melting points and boiling points.
- Out of these properties, what are the properties that can be seen in ionic compounds?
- (1) A and B
  - (2) B and C
  - (3) C and D
  - (4) A and D
- (29) A load of 1000 N is raised by a crane 4 m vertically up in 10 s. Which answer shows the power of the crane?
- (1)  $\frac{1000 \times 4}{10}$  W
  - (2)  $\frac{1000 \times 10}{4}$  W
  - (3)  $\frac{10 \times 4}{1000}$  W
  - (4)  $\frac{10}{1000 \times 4}$  W
- (30) Which of the following equations represents a single displacement reaction?
- (1)  $2Mg + O_2 \longrightarrow 2MgO$
  - (2)  $2H_2O_2 \longrightarrow 2H_2O + O_2$
  - (3)  $Mg + 2HCl \longrightarrow MgCl_2 + H_2$
  - (4)  $BaCl_2 + 2AgNO_3 \longrightarrow 2AgCl + Ba(NO_3)_2$
- (31) Four organisms are shown by A, B, C and D
- |            |                |                |               |
|------------|----------------|----------------|---------------|
| A - amoeba | B - Paramecium | C - Valisneria | D - White ant |
|------------|----------------|----------------|---------------|
- In which two organisms can an organelle level organization be seen.
- (1) A and B
  - (2) B and C
  - (3) A and D
  - (4) C and D

- (32) Which characteristic cannot be seen in virus?  
 (1) Contains only DNA or RNA (2) reproducing only in living cells.  
 (3) Enclosing the nucleic acid by a protein capsid. (4) contains organelles.

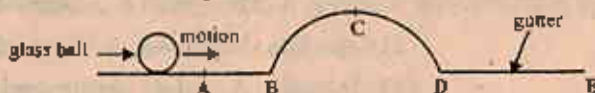
(33) Which of the following chemical reactions is not relevant for extraction of iron?



(34) 2 ml, 4 ml, 6 ml and 8 ml dilute HCl solution is put into four test tubes A, B, C and D. Distilled water is added to them till the final volume is 10 ml. Identical pieces of zinc are put into these test tubes in the same time. Which answer shows the rate of reaction in the ascending order?

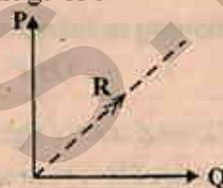
- (1) D, C, B, A (2) A, B, C, D (3) D, B, C, A (4) A, B, D, C

(35) This diagram shows a smooth gutter. A glass ball is moving forward in a uniform velocity passing the point A.



Which of the following statements is correct regarding the motion of the glass ball?

- (1) It is moving with a uniform acceleration from A to B.  
 (2) It is moving with a uniform deceleration from B to C.  
 (3) It is moving with a uniform deceleration from C to D.  
 (4) It is moving with a uniform acceleration from D to E.



(36) This diagram shows how two coplanar forces P, Q act on an object. Their resultant force is shown by R.

To keep the object in equilibrium,

- (1) a similar force to R should be applied towards P.  
 (2) a similar force to R should be applied towards R.  
 (3) a similar force to R should be applied to the opposite direction of P.  
 (4) a similar force to R should be applied to the opposite direction of R.

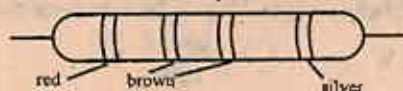
(37) Four circuit diagrams are shown below.



Out of them, equivalent resistance of which circuit becomes R?

- (1) A (2) B (3) C (4) D

(38) Which answer shows the correct value of the permanent resistor shown in the diagram?



- (1)  $21 \pm 10\%$  (2)  $210 \pm 10\%$  (3)  $201 \pm 10\%$  (4)  $2010 \pm 10\%$

(39) What is the most suitable action that can be taken to avoid from germ infection?

- (1) Drinking cooled boiled water (2) Drinking distilled water  
 (3) Drinking water refined by water filters (4) Drinking bottled water

(40) The most suitable action to control dengue is,

- (1) Using a bacteria to control mosquito larva (2) destroying breeding places of mosquitoes  
 (3) repelling adult mosquitoes by mosquito repellants (4) Using mosquito repellent creams



# Southern Provincial Department of Education

## Year End Test - 2017

Science - II

Grade 10

Name / Index No. ....

Time - 1 hour

### Instructions

- Answer for part A in the space given.
- Select 03 questions from part B and answer them.

### Part A - Structured Essay

(01) Read the paragraph and answer the following questions.

Atmosphere is a covering that surrounds the earth. It consists of mixture of gases. These gases exist around the earth without going away due to the gravitational force of the earth. The most abundant gases in the atmosphere are  $N_2$ ,  $O_2$ , Ar and  $CO_2$ . Ne, He,  $H_2$  and  $O_3$  gasses are present in traces.

$CH_4$ ,  $SO_2$ ,  $CO$ ,  $NO_2$ ,  $H_2S$  and CFC gases are present as air pollutants. In addition to these, water vapour is present but its composition get changed. Solubility of  $NO_2$  and  $SO_2$  gases in water takes a high value.

Mainly  $CO_2$  helps to maintain the temperature of the earth. Additionally  $CH_4$ ,  $SO_2$ ,  $H_2O$ ,  $O_3$  and CFC gases contribute in a certain amount for it.  $SO_2$  is emitted due to combustion of coal and  $NO_2$  due to combustion of fuel to the environment. Emission of  $NO_2$  can be controlled by fixing catalytic converters to the exhaust system of vehicles. Emission of  $SO_2$  can be controlled by burning coal from which sulphur removed.

(1) (a) Global warming is a main environmental problem in the present. Increasing the concentration of which gas is the main reason for it.

(b) What is the main human activity that helps to increase releasing this gas?

(c) Mention a suitable alternative to reduce the activity given in part (b)

(d) what is the function of the gas shown as  $O_3$

(2) Acid rains are occurred when acidic gases dissolve in water.

(a) Name the two main gases responsible for the occurrence of acid rains.

(b) Write two environmental problems occurred due to acid rains.

(c) Name one method each for reducing releasing the gases you mentioned in part ii (a) to the atmosphere.

(iii) Elements like C, O, N circulate on the earth, in the atmosphere and in organisms bodies in a cyclic manner.

(a) Name the biological process that removes  $O_2$  from the atmosphere.

(b) What is the biological process that helps to re-balance the  $O_2$  removed in this way?

(c) Name the group of organism that helps for it?

(iv) "Collection of dust in large amounts to the atmosphere halved the production of food in plants."

Write a fact to prove it.

(02) (A) Bio chemical reactions like cellular respiration are catalyzed by enzymes. Shown below are several steps of an activity done to demonstrate the action of amylase on starch.

- Taking aqueous solution of starch into a test tube and adding equal volume of amylase enzyme into it.
- Mixing it well and separating into 3 equal volumes. Putting them into 3 test tubes P, Q and R.
- Immersing the 3 test tubes in a water vessel at a temperature of  $37^\circ C$ .
- Adding a drop of Iodine into them as given below.  
after 1 minutes to P  
after 10 minutes to Q  
after 30 minutes to R

(i) What is the reason for taking an aqueous solution of starch for the activity.

(ii) What is the colour obtained when Iodine is added to a starch solution.

(iii) Align P, Q and R from high colour (above mentioned colour) place to low colour place.

(iv) To which kind of simple sugar is starch converted by amylase in the mouth?

(v) Is the rate of bio chemical reactions decreased or increased by enzymes?



(B) 75% of weight of human body is water. There is considerable amount of protein in it. Other biological molecules and mineral salts are also present in the body.

(i) Write 2 ways how protein is significant for the activity of human body.

.....  
.....

(ii) Write 2 ways how water is significant to the activity of human body.

.....  
.....

(iii) Name two main biological molecules present in the body other than Carbohydrates and proteins.

.....  
.....

(iv) Fill in the blanks in the paragraph given below.

Outer boundary of a plant cell is known as cell wall. It is made up of (i) .....  
The biological molecule it belongs is composed of elements hydrogen and (ii) .....  
Inner membrane to the cell wall is known as (iii) .....

(03) (A) Description about 4 elements out of first 20 elements in the periodic table are shown below. Symbols used are not standard symbols. Answer the questions only using the given symbols.

L- Valence shell is completed. Locates right side of the strongest electronegative element.

M - becomes stable by making univalent positive ions. It has the lowest first ionization energy.

Q - active gaseous element. It occupies 20% of volume of the atmosphere.

R - Possesses the hardest allotropic form that exists naturally. Used for making electrodes.

(i) Identify L, M, Q and R and name them.

L..... M..... Q..... R.....

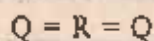
(ii) Show in an equation how an atom of M becomes a univalent positive ion.

.....

(iii) Write the formula of the compound made by the chemical combination of M and R.

.....

(iv) An incomplete diagram of a lewis structure of a molecule made by the reaction between R and Q is given below. Complete it.



(B) Information about several elements are given below.

element	mass of an atom (g)
C	atomic mass unit x 12
O	atomic mass unit x 16
S	atomic mass unit x 32

Answer the following questions using the above information.

(i) define the word 'atomic mass unit'

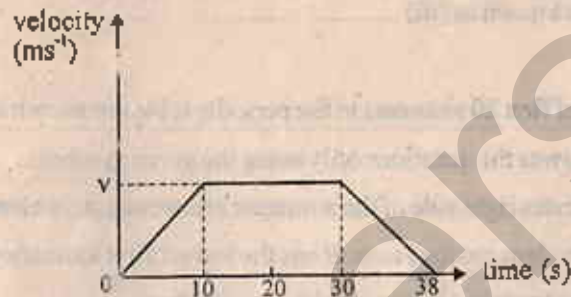
(ii) What is the relative atomic mass of S.

(iii) (a) What is the relative molecular mass of  $\text{SO}_2$ ,

(b) What is the mass of 2 moles of  $\text{SO}_2$ ,

(c) What is the mass of 1 molecule of  $\text{SO}_2$ ,

(04) (A) The velocity-time graph of an object which moved along a straight line is given below.



(1) Name two vector quantities that can be identified using the graph.

(ii) (a) build up the statement that gives the displacement (S) of the object using the graph.

(b) find the value of  $v$ , if  $\bar{S} = 290\text{m}$

(c) Calculate the acceleration of the object between 0S - 10S

(iii) If the mass of the object is 20kg, calculate the unbalanced force acting on the object in the direction of the motion between 0S - 10S

(iv) (a) What is the unbalanced force acting on the object during 10S - 30S

(b) Name the Newton's law that explains it and write the law.

(c) What is the direction of the unbalanced force acting on the object during 30S - 38S





(a) (a) What is the special type of bond present among water molecules in water?

(b) Name a special physical property possessed by water due to the above mentioned bond type.

(c) How can you show using an activity that sodium chloride is composed of  $\text{Na}^+$  and  $\text{Cl}^-$ ?

(B) Consider the activities given below named as P, Q, R and S.

P - burning magnesium in air

Q - putting a cleaned piece of zinc into a copper sulphate solution

R - Heating a piece of sulphur in a crucible.

S - Splitting a log of wood.

(i) Write 2 letters of activities that come under chemical changes.

(ii) What is the letter of the activity that gives a gaseous product?

(iii) (a) Write the balanced chemical equation

(b) Write one observation

relevant to the activity Q

(iv) According to the activity Q which metal is more active copper or zinc.

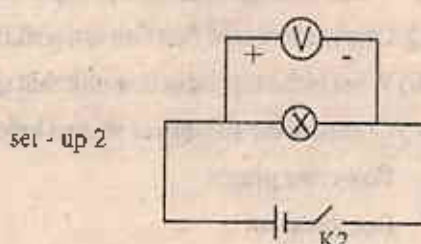
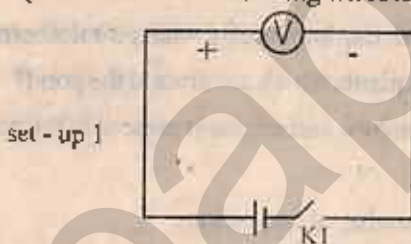
(C) (i) Hydrogen gas can be produced by reacting magnesium with an acid. Write the formula of an acid mostly used in this activity.

(ii) How can you prove that the gas sample produced is Hydrogen?

(iii) Mention two ways that the rate of reaction of part C (i) can be increased.

(07) (A) Shown below are two set-ups prepared by using two identical cells and two identical voltmeters.

(Resistance of connecting wires is negligible)



(i) (a) Using which set-up can you obtain the voltage of the cell?

(b) What should be done for it?

(c) When the  $K_2$  switch is closed, reading of the voltmeter in set-up 2 can be obtained. Is it higher or lower than the reading obtained in part (b) above. Explain the reason for it.

(B) Diagram shows a piece of metal hung in a Newton balance.

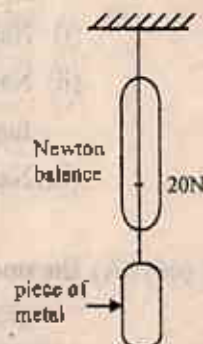
(i) The piece of metal was completely immersed in water while hanging in the Newton balance. Then the reading of the balance was 16N.

(a) What is the upthrust created by water on the piece of metal?

(b) What is the weight of displaced volume of water in this instance?

(ii) The piece of metal was taken out of water and immersed

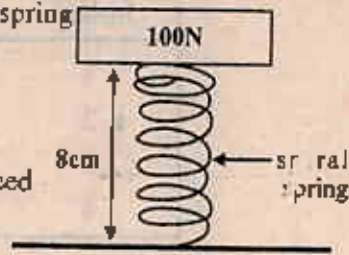
completely in coconut oil. Then the weight of volume of displaced coconut oil is higher than the displaced weight of volume of water in part (b). Explain the reason for this scientifically.



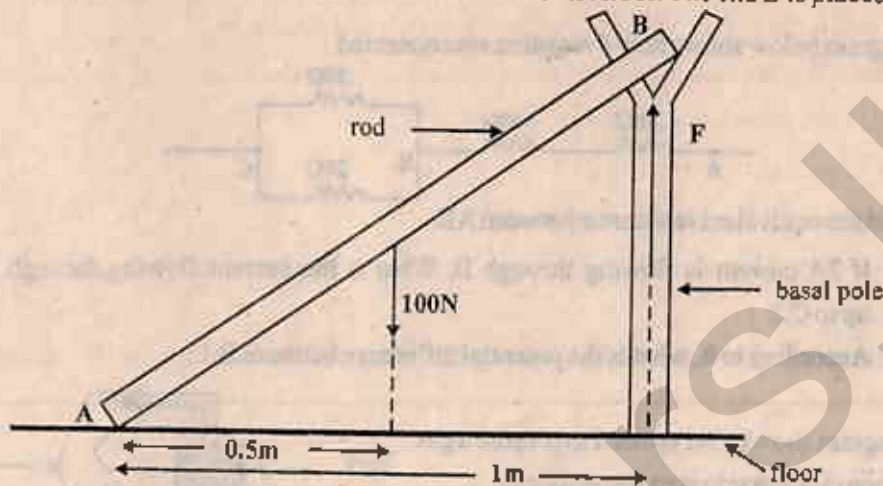


(C) A 10 cm long spiral spring is kept in a vertical position by fixing one end of it to a table. A load of 100N is balanced on the open end of the spring. Then the length of the spring get decreased up to 8cm.

- What is the amount of work done by the load on the spring?
- How much of elastic potential energy is stored in the spring?
- How much of potential energy is stored in the load which is balanced on the spring?
- What is the reaction force created by the spring on the load?



(D) The end A of the uniform rod AB touches the horizontal floor. The end B is placed on a basal pole.



- What is the clockwise moment of force on the rod around point A.
- Using i, calculate the force F applied by the basal pole on the rod at the point B.

(08) (A) An activity was done to obtain a new plant from a certain plant. In this, a matured leaf was removed from a small plant stem. After 3 to 4 days of this, an active bud above the leaf scar was removed by a sharp knife. Next this bud was fixed to a suitable plant stem and wrapped by polythene stripes.

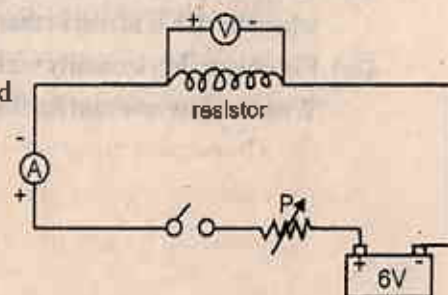
- Name the vegetative reproductive method done by using buds.
- What do you call the plant part connected to the soil to which the bud is fixed?
- Write two important characteristics that should be possessed by the plant part you mentioned in part (ii)
- Write 2 advantages of vegetative reproductive method mentioned in part (i) above.

(B) (i) Name 2 methods of cell division.

- Write the number of chromosomes present in daughter cells after the end of cell divisions mentioned in part (i)
- How many chromosomes are there in a zygote made by joining two gametes each with 'n' number of chromosomes?

(C) The amount of current flowing through a resistor get changed when the potential difference at the two ends of it is changed. A circuit diagram of an activity that can demonstrate it is shown below.

- (a) Name the instrument used in the laboratory for P.
- What is done by P.

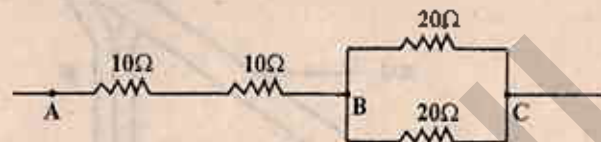


- (ii) These instruments were used accurately and ammeter and voltmeter readings were obtained. Such readings obtained in 4 instances are shown in the table below.

Instance	potential different (V)	Current (A)
1	1.2	0.1
2	2.4	0.2
3	3.6	0.3
4	4.8	0.4

- (a) Plot a graph using the above readings potential difference against current.  
 (b) Write the relationship between potential difference and current, according to it.

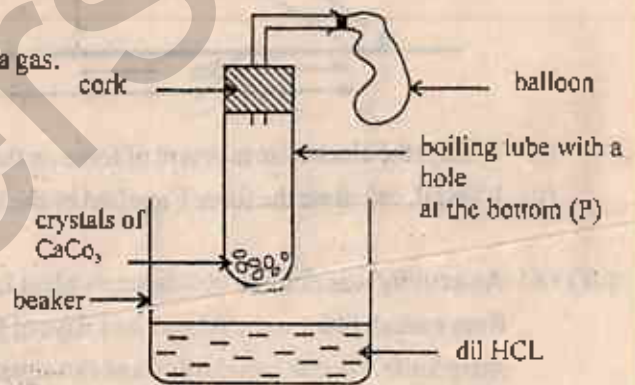
- (D) The diagram below shows how 4 resistors are connected.



- (i) Find the equivalent resistance between AB.  
 (ii) (a) If 2A current is flowing through B, What is the current flowing through 20Ω resistors up to C?  
 (b) According to it, what is the potential difference between B,C.

- (09) (A) This diagram shows a set up used to prepare a gas.

- (i) What should be done to start the reaction?  
 (ii) Write 2 observations that can be seen after doing the above change.  
 (iii) Write the balanced chemical equation relevant to this reaction.  
 (iv) In this activity 0.44g of  $\text{CO}_2$  was produced.



- (C = 12, O = 16)  
 (a) Find the molar mass of  $\text{CO}_2$   
 (b) How many moles are there in 0.44g of  $\text{CO}_2$ .

- (B) This diagram shows a set up that uses the siphon method to remove waste water from a fish tank.

- (i) Keeping at which level out of P, Q should the end of the rubber tube with the clip be opened to remove water.  
 (ii) Explain scientifically how water is removed in this instance.  
 (iii) Mark in a diagram, the forces that act on the fish, when the fish is at rest in that place.  
 (iv) Fish swims horizontally with a uniform velocity. Write the law relevant for this motion.

